

Aronvit[®]

Aronia melanocarpa

UNIQUE STANDARDIZED EXTRACT
FROM ARONIA BERRIES



WHAT IS Aronvit®

Aronvit® is a unique, standardized extract from selected aronia berries. As a result of our own technology development efforts we have obtained a pioneering, prime quality extract with a rich anthocyanin content. Thanks to a high content of anthocyanins, **Aronvit®** extract shows a wide range of beneficial health results, including a number of positive metabolic changes, as reported in literature.

SPECIFICATIONS

Thanks to procurement sources of raw materials from local contractors **Greenvit** is able to fully manage product identity and quality. **Aronvit®** has been standardized for the content of **anthocyanins** (HPLC) and **polyphenols** (UV) as well.

To meet the needs of different recipients, **Greenvit** is able to propose tailor-made solutions in the following extract versions:

Name	Anthocyanin content %	Polyphenol content %
Aronvit® 25	25	50
Aronvit® 20	20	30
Aronvit® 15	15	22,5
Aronvit® 10	10	15

RECOMMENDED USE AND DOSE

Aronvit® is a dark purple to black fine powder with good technological properties. It can be suitably used in the form of syrup, capsule and tablets. The suggested daily dose is 50-150 mg.

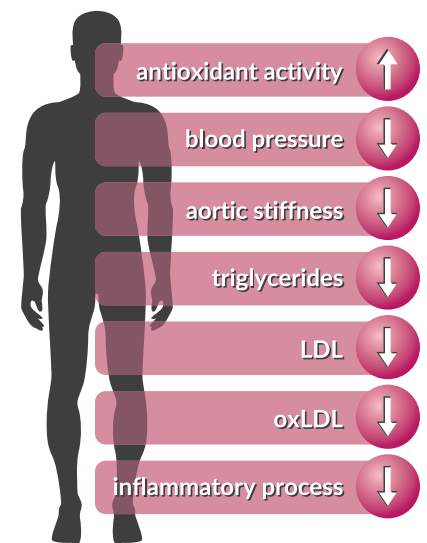
BENEFITS OF USING ARONVIT® AND TARGET GROUP

Aronia is the healthiest berry in the world, with one of the highest scores on the ORAC* scale. In other words, as an antioxidant, it has the highest capacity of absorbing reactive oxygen species (ROS).

The bioavailability of polyphenols and anthocyanins in food depends mostly on food storage conditions and techniques of meals preparation. Processing and purification of vegetal food affect adversely the level of antioxidant substances. That's why **Aronvit® standardized extract with the high content of anthocyanins and polyphenols is a perfect choice to ensure proven, versatile health benefits.**

Aronvit® is recommended for use by all people exposed to adverse environmental factors, in particular in prevention and assistance to patients with:

- cardiovascular disorder
- diabetes
- hepatic disorders
- in prevention of vision problems
- deteriorating lung function

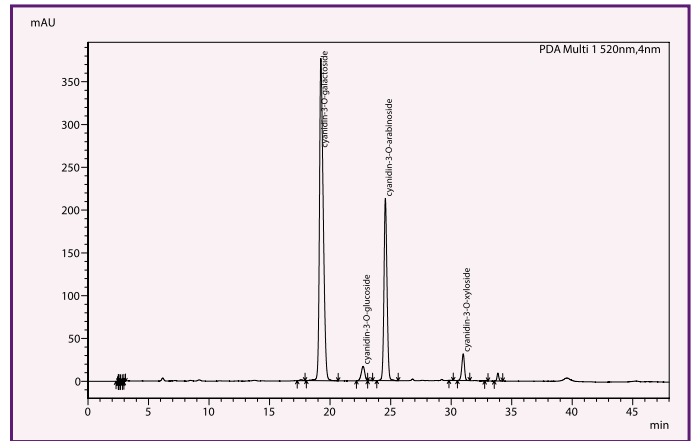


Anthocyanins influence on human health parameters

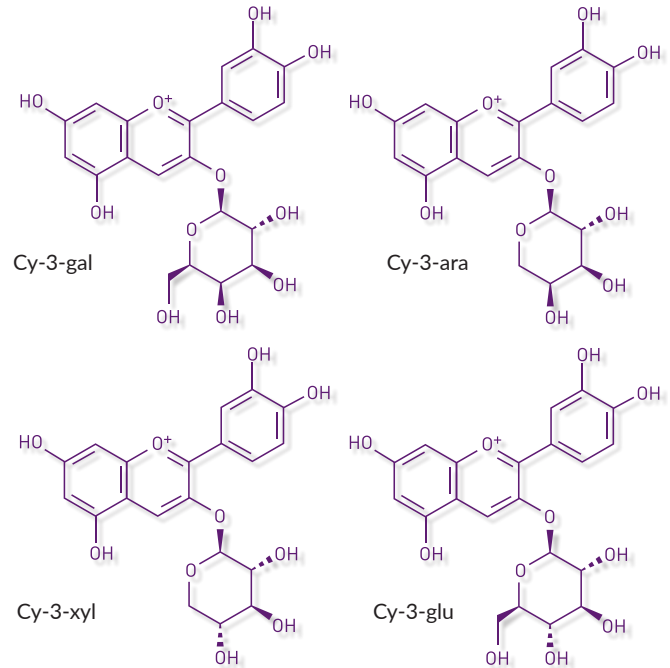
ARONVIT® TRADEMARK

Aronvit® registered trademark is the property of **GREENVIT** company. The trademark may be used solely together with the purchased extract complex.

*ORAC (Oxygen Radical Absorbance Capacity)



Anthocyanin fractions: Cy-3-gal Cy-3-ara Cy-3-xyl Cy-3-glu chlorogenic acid



RESEARCH ON ANTHOCYANINS:

Anthocyanins belong to molecules classified as flavonoids from polyphenol family. They are widespread in the world of plants, and are found in lots of flowers and fruit. Their name (in Greek *Anthos* means flower and *kyanose* means blue) was initially used to describe the blue pigment of the cornflower (*Centaurea cyanus*). As compounds commonly found in plants, anthocyanins are a vital element in the human diet.

Reactive oxygen species (ROS), i.e. free radicals and molecules which can generate them, are involved in several vital physiological processes. Because the excessive production of free radicals, like their shortage, may be harmful for the body, it is important to keep the balance between pro- and antioxidant mechanisms. Along with the better understanding of the role of oxidative stress caused by ROS in the occurrence of several chronic diseases, anthocyanins has started to be knowingly used as antioxidant compounds with beneficial health effects, and namely with antioxidant, anti-inflammatory, anti-atherosclerotic and antidiabetic action.[1][2]

Based on NHANES 2007-2008 data, the average intake of anthocyanins in the U.S. was estimated at 11.6 mg/person/day (+/-1.1mg) in adults >20 year old. [3]

IMPACT OF ANTHOCYANINS ON THE CARDIOVASCULAR SYSTEM AND IN DIABETES

Anthocyanins hold good for the improvement of lipid parameter, glucose levels, endothelial function and redox status in the body weight loss. In particular, anthocyanins show protection properties for the cardiovascular system and the heart muscle itself. The positive impact of anthocyanins on the cardiovascular system is associated with their anti-inflammatory properties, their ability to strengthen capillaries, and to slow down the aggregation and adhesion of blood platelets [4]. As it has been observed in animal and human models the vasodilator action, i.e. the relaxation of vascular smooth muscles, helps lower the blood pressure.[5][6]

Moreover, a diet rich in anthocyanins improves the plasma lipid profile by reducing the total cholesterol concentration, LDL fraction and triglycerides [7].

Additionally, by reducing the action of enzymes active in lipid metabolism, anthocyanins inhibit their oxidation and immunological response to LDLox and their capture by macrophages [8],[9].

The findings from studies conducted on animal models to analyze the protective effect of anthocyanins in insulin resistance and obesity showed that anthocyanins are effective in increasing tissue responsiveness to insulin, in reducing weight gain and lipid accumulation. For instance, in their study of 2017, Yamane et al. [10] demonstrated the suppression of elevation of postprandial blood glucose levels. Finally, anthocyanins help prevent the damage to blood vessels, typical in the course of diabetes, and the positive effect of anthocyanins on microcirculation translates into their positive impact on diabetic retinopathy.

INFLUENCE OF ANTHOCYANINS ON ANTI-INFLAMMATORY ACTIVITY

The anti-inflammatory action of anthocyanins is manifested in the regulation of tension in capillary walls, which in turn reduces the cell inflammatory response. Anthocyanins inhibit, among all, NF- κ B and the synthesis of inflammatory mediators (PGE₂), and reduce the activity of COX-2. They regulate PLA₂, COX-2, LOX enzymes and have the ability to regulate iNOS activity. As a part of their protective function in inflammatory processes, anthocyanins trigger the synthesis of prostacyclin (PGI₂) produced in endothelial cells and foster their anti-aggregation action (like acetylsalicylic acid).[11][12]

IMPACT ON ANTHOCYANINS ON THE EYE FUNCTION

Anthocyanin colorants improve visual acuity by speeding up the regeneration of rhodopsin or by activating enzymes involved in its production [13].

Anthocyanins reduce the vulnerability to infections (inflammations) and mitigate the existing inflammatory conditions. Based on the animal model it has been demonstrated that their use may be beneficial in non-infectious inflammations such as uveitis [14]. The positive effect of anthocyanins on microcirculation translates into their favorable action on diabetic retinopathy. [15].

ANTHOCYANINS IN NAFLD (non-alcoholic fatty liver disease)

According to data from 2016, NAFLD is considered as one of the most common causes of liver diseases [16]. Almost half of diabetic patients struggle also with NAFLD, and nearly 80-90% of obese individuals (BMI>30) suffer from the diagnosed NAFLD. As it is commonly known, the accumulation of lipids in liver aggravates oxidative stress, and as a result, inflammatory conditions. Because the production of active oxygen species in the course of NAFLD and insulin resistance are caused by mitochondrial dysfunction, it is suggested to use antioxidants in their therapy.[17][18]

ANTHOCYANINS AND IONIZING RADIATION

Findings reported in literature show that polyphenols (anthocyanins) found in aronia berries may alleviate the effects of (gamma) ionizing radiation in animal models. This is manifested by the reduced level of superoxide anion radical (one of ROS forms) and the normalization of leucocyte numbers. Similar beneficial effects of relieving radiation sickness symptoms have also been observed in rats [19] [20].

MOST RECENT REPORTS ON THE IMPACT OF ANTHOCYANINS ON LUNG FUNCTIONS

The study presented at the 2018 ATS (American Thoracic Society) conference confirms that the intakes of anthocyanins can be associated with a significantly lower deterioration of lung functions in the general population, and especially in individuals who have never smoked or quit smoking. The study* has showed a lower annual FEV1 decrease rate, the lowest annual FVC decline as well as the lowest annual FEV1 / FVC drop in people with the highest anthocyanin intakes, as compared to the lowest ones. In experimental studies on COPD (chronic obstructive pulmonary disease) anthocyanins were detected in the lung tissue and are now associated with the reduction in mucus secretion and inflammatory infiltrations. [21],[22]

CONCLUSION:

The positive effects of anthocyanin intake, as describe above, occur as a result of a combined action of several mechanisms. While only some of them are directly connected with the antioxidative effect, and the majority is triggered by anthocyanin indirect action, **Aronvit®** standardized extract with the rich content of anthocyanins is still a reliable everyday source of healthy dietary ingredients.

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*Spirometry test used to measure the volume of air which can be exhaled in one second (FEV1), the total amount of volume which can be exhaled after a deep breath (FVC) and their ratio: FEV1 / FVC.

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